

What is claimed is:

1. A tire assembly, comprising:

a safety rim, having a generally U-shaped cross-section, an inner
5 surface and an outer surface, and defining left and right recesses on its inner
surface;

a tire mounted on said safety rim, said tire including left and right
edges received in said left and right recesses, wherein a hollow space is formed
between said tire and said rim; and

10 a plurality of inflated balls located in said hollow space.

2. A tire assembly as recited in claim 1, and further comprising a main
valve extending through said rim to permit gas to be inserted into and removed
from said hollow space through said main valve.

3. A tire assembly as recited in claim 1, wherein at least one of said
inflated balls includes a valve which can be used to insert pressurized gas into
and remove gas from the interior of said ball to control the internal pressure of
said ball.

4. A tire assembly as recited in claim 2, wherein at least one of said
balls includes an individual valve which can be used to insert pressurized gas

into and remove gas from the interior of said ball to control the internal pressure of said ball.

5 5. A tire assembly as recited in claim 4, and further comprising a rim lock inside said rim, said rim lock being secured to said rim and pressing said left and right tire edges against said rim.

6. A tire assembly as recited in claim 1, wherein adjacent balls within said tire have substantially different internal pressures.

10 7. A tire assembly as recited in claim 1, and further comprising an inflatable tube between said balls and said rim, said inflatable tube including a main valve which is accessible from outside said rim.

15 8. A tire assembly as recited in claim 1, wherein said balls are made of polyurethane sheets that are welded together, and wherein said balls include individual valves for inflating the balls to a predetermined pressure.

20 9. A tire assembly, comprising:
a safety rim, having an inner surface and an outer surface, and defining left and right recesses on its inner surface;
an opening through said safety rim, and a valve in said opening for controlling the flow of gas through said rim;

a tire mounted on said safety rim, said tire including left and right edges received in said left and right recesses, said left and right edges including left and right embedded cords; and

a plurality of gas-filled balls located between said tire and said rim,
5 each of said balls having a thin wall, and an individual valve which controls the flow of gas through the thin wall, wherein the pressure of gas on the interior of each ball is substantially greater than the ambient pressure in order to maintain the ball in an inflated state.

10 10. A tire assembly as recited in claim 9, wherein said balls are made of welded together sheets.

11. A tire assembly as recited in claim 10, wherein said sheets are made of polyurethane.

15 12. A tire assembly as recited in claim 9, wherein adjacent balls are inflated to substantially different internal pressures.

20 13. A tire assembly as recited in claim 9, and further comprising a rim lock, which presses the embedded cords against the rim.

14. A tire assembly as recited in claim 9, and further comprising an inflatable tube mounted between said balls and said rim, including a main valve accessible through said rim.

5 15. A tire assembly as recited in claim 1, wherein each of said balls has a diameter, wherein each ball can support a load in pounds that is at least as great as one hundred times the cube of its diameter in inches without exceeding its tensile limit and without exceeding its elastic limit, and wherein the wall thickness of said ball is less than three percent of its diameter.

10 16. A tire assembly as recited in claim 9, wherein each of said balls has a diameter, wherein each ball can support a load in pounds that is at least as great as one hundred times the cube of its diameter in inches without exceeding its tensile limit and without exceeding its elastic limit, and wherein the wall thickness of said ball is less than three percent of its diameter.

17. A tire assembly as recited in claim 1, wherein said balls are made of polyurethane sheets that are welded together.

20 18. A ball for use in a tire assembly, comprising:
a thin wall, defining an interior surface and an exterior surface and a diameter;

wherein the thickness of said thin wall is less than two percent of the diameter, and wherein said ball can support a load in pounds that is at least one hundred times the cube of its diameter in inches without exceeding its tensile limit, without exceeding its elastic limit, and without expanding more than 50% from its initial surface area.

19. A ball as recited in claim 18, wherein said ball includes a valve.

20. A ball as recited in claim 19, wherein said ball is made of polyurethane.

21. A ball as recited in claim 20, wherein said ball is made of welded-together sheets.